Portrait Drawing as an Intervention for Adults Diagnosed with Autism Spectrum Disorder

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Dear Ms. Dubar:

This letter serves to officially notify you of approval by the Albertus Magnus College IRB for you to conduct your study employing the methodology described in your IRB application. Please ensure that copyright protected material included in your study is properly protected as well as the confidentiality of your research participants.

Your study is authorized to begin as of the date of this approval letter and is valid for one year, ending on February 24th, 2021.

If you have any questions, please contact Hilda Speicher, Ph.D., the IRB Administrator, by phone at 203-773-8548 or by e-mail at hspeicher@albertus.edu.

Sincerely,

Sean P. O'Connell, Ph.D.	Hilda Speicher, Ph.D.
IRB Chair	IRB Administrator

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Abstract

The present study was designed to measure the effects of portrait drawing on adults diagnosed with autism spectrum disorder (ASD). Participants (*N*=10) were recruited from various local agencies that serve individuals with ASD. Originally, the researcher intended to conduct two sessions of two conditions, portrait drawing and still-life of fruit, but only portrait drawing could be fully completed due to the unexpected global pandemic. Conditions were randomly assigned and sessions were conducted in small groups within the agencies. Participants were given the Social Interaction Anxiety Scale (SIAS) and staff were given the Autism Social Skills Profile (ASSP) to measure social anxiety and overall social skills before and after the two sessions. Another score called facial recognition (FR) was created using several questions from the ASSP. Results show significant improvement of FR scores after portrait drawing and a trend of improvement in ASSP scores, though not significant. Implications, limitations, and directions for future research are discussed in the present study.

Portrait Drawing as an Intervention for Adults Diagnosed with Autism Spectrum Disorder

According to the fifth edition of the American Psychiatric Association (APA) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), autism spectrum disorder (ASD) is a wide-ranging disorder characterized by communicative and interactive social deficits (American Psychiatric Association, 2013). Symptoms of ASD also include "restricted, repetitive patterns of behavior, interests, or activities" (p. 50), such as inflexible behavior, intense fixation on interests, or under or over reactivity to sensory input.

The expression of symptoms in autism is diverse and level of functioning is seen as existing on a spectrum. The DSM-5 categorizes autism into three levels of severity, with level 1 "requiring support," level 2 "requiring substantial support," and level 3 "requiring very substantial support" (APA, 2013). A practitioner making a diagnosis of ASD should specify whether there are intellectual or language impairments, as well. According to the APA, individuals with a diagnosis of Asperger's Disorder or pervasive developmental disorder from DSM-IV fall within the diagnosis of autism spectrum disorder as well. Although these titles were removed to consolidate the diagnosis due to the similar features of each, they are still commonly used and widely accepted as indicators of autism spectrum disorder; Asperger's Disorder specifically is still considered a type of high-functioning autism (Autism Society, 2020).

The APA (2013) reports that the number of cases of ASD in the U.S. and its territories has approached 1% of the population. Males are diagnosed with ASD four times more often than females. While there is no proven cause of autism, the DSM-5 identifies environmental and genetic risk factors. Older age in parents, low birth weight, and fetal exposure to valproate, an ingredient in some medications, may increase the risk of ASD. Additionally, the APA reports that ASD is estimated to have relatively high heritability, ranging from 37% to 90%.

Persons on the autism spectrum have been shown to have difficulties in facial recognition due to delays in certain parts of the brain. According to McPartland et al. (2004), individuals on the autism spectrum display longer delays in event-related brain potentials (ERP) to faces than neurotypical individuals. This delay is referred to in the literature as the N170 in relation to the average time in milliseconds it takes for a neurotypical person to recognize a human face.

Using a combined sample of 23 participants, nine of which were diagnosed with ASD, McPartland et al. (2004) tested facial recognition using 240 stimulus cards, including faces, some inverted, and furniture, some inverted. The ERP data was collected through electroencephalogram (EEG) during testing. The results of the study indicated that the group of individuals with ASD had significantly longer latencies in the N170 than the neurotypical group. The authors also found that individuals with ASD exhibited significantly fewer differences in the N170 latencies between up-right and inverted faces, while neurotypical individuals took significantly longer to recognize inverted faces than up-right faces.

Facial recognition is important to social interaction because facial cues contain information about emotions and reactions. Impairments in facial recognition may be related to social inhibition and social anxiety according to Avery et al. (2016). Using a sample of 52 young adults with varying levels of social inhibition, the authors used the Repeated Faces task to measure facial recognition. During the task, participants viewed 128 in the first phase. Participants were then shown 32 previously seen faces and 32 new faces in random order and asked to indicate whether each face was familiar or novel. The authors found that there was a relationship between impaired facial recognition and social inhibition.

Emotional recognition is also a challenge for individuals on the autism spectrum. Baron-Cohen et al. (1999) utilized functional magnetic resonance imaging (fMRI) to examine brain differences in neurotypical individuals and individuals on the spectrum during an expression identification task. The sample consisted of six individuals with ASD with an average age of 26, and 12 neurotypical participants matched for age, handedness, IQ, socioeconomic status, and educational level. The study involved two brief tasks (A and B) that were alternated every 30 seconds five times. Task A involved identifying gender from images of eyes. Task B involved the same images, but participants were asked to choose from two words which best indicated the emotional state of the person in the image. Results showed that the neurotypical control performed significantly better on both tasks than the ASD group. The fMRI imaging also indicated each group showed activation in different brain regions for both tasks. The neurotypical group showed more activation in frontal regions and the amygdala, which was not activated at all in the ASD group. These results indicate that individuals on the spectrum may have difficulty recognizing emotions due to differences in brain structure and activation.

Functional impairments in individuals with ASD may also be related to experiences of social anxiety (Bejerot et al., 2014). Bejerot et al. administered the Liebowitz Social Anxiety Scale (LSAS) to 50 high-functioning adults diagnosed with ASD, 53 adults without ASD, and 100 adults diagnosed with Social Anxiety Disorder (SAD). After analysis, the researchers found that those with high functioning ASD were significantly higher on social anxiety than non ASD individuals, though lower than the individuals with SAD. Additionally, 28% of participants with ASD had clinically significant scores for diagnosis of SAD. Finally, the authors posit that the experience of social anxiety in ASD may contribute to the social avoidance characteristic of ASD.

Kuusikko et al. (2008) hypothesized that social anxiety increases with age in ASD while it does not in the general population. To test this, the researchers administered self-report and parental questionnaires to a sample of 58 Finnish children (8-15) diagnosed with high functioning autism or Asperger syndrome (HFA/AS) and 353 neurotypical students (aged 8-16) from Finnish schools. The questionnaires used included the Social Phobia and Anxiety Inventory for Children, the revised Social Anxiety Scale for Children, and the Child Behavioral Checklist parent report form. Analyses revealed that the HFA/AS group reported significantly higher social anxiety than their neurotypical peers. Furthermore, the social anxiety symptoms reported in the older children in the HFA/AS group were clinically significant. Additionally, while social anxiety symptoms in the neurotypical sample decreased with age, social anxiety increased in the HFA/AS sample. According to Kuusikko et al., the discrepancy between HFA/AS and neurotypical individuals may be due to the delayed socio-emotional development in autism spectrum disorder.

Perhaps more alarmingly, depression and suicidality are highly prevalent in adults with ASD (Cassidy et al., 2014; Hedley et al., 2017; Howlin & Magiati, 2017). The pervasiveness of ASD and severity of anxiety and depressive symptoms in this population warrant further research to improve treatment options. Much of the research in the treatment of ASD is understandably focused on childhood because, as noted by the APA (2013), the best outcomes for ASD involve early intervention; however, symptoms of ASD can still continue into adulthood and, in cases in which interventions were not used in early life, independent functioning can be severely impaired.

A French retrospective study by Chamak and Bonniau (2016) analyzed the trajectories of 76 adults diagnosed with ASD. Of the total sample, 17 were considered high functioning. Parents of the participants were surveyed to collect the data. The researchers found that while high functioning adults on the spectrum had better outcomes than those with more severe symptoms, all were still dependent on aging parents and led restrictive lives. Additionally, only 44% of parents were satisfied with the services and outcomes for their adult children. Therefore, research relating to age appropriate treatments for the symptoms of ASD is important to the wellbeing of adults on the spectrum.

According to Sadock et al. (2015), treatments for ASD include psychosocial interventions, psychopharmacological interventions, and complementary and alternative medicine approaches (CAM). Psychosocial approaches include early intensive interventions, social skills training, behavioral interventions, cognitive behavioral therapy, and educational interventions. Psychopharmacological interventions involve medications to treat specific symptoms of ASD, such as antipsychotic medication for irritability, methylphenidate for hyperactivity and inattention, as well as selective serotonin reuptake inhibitors (SSRI) and antidepressants for repetitive behavior. Finally, nontraditional CAM treatment approaches include music therapy and yoga according to the researchers.

Art therapy, a form of psychotherapy that utilizes artmaking to foster communication is another intervention with some evidence of efficacy in treating symptoms of ASD, especially deficits in social skills (D’Amico & Lalonde, 2017; Epp, 2008; Richard et al., 2015) D’Amico and Lalonde (2017), for example, conducted a study to evaluate the efficacy of art therapy combined with social skills training for increasing social skills in children diagnosed with autism spectrum disorder (ASD). The study utilized a quasi-experimental design with a sample size of six children between the ages of 10 and 12. Using the Parent and Student Forms of the Social Skills Improvement System–Rating Scales (SSIS–RS), the ability to effectively use social skills was measured for each child pre and post treatment. The treatment involved group art therapy once a week for 21 weeks. Each session focused on specific areas of weakness determined by the preliminary SSIS–RS by combining social skills training with an art intervention. Results revealed that while for many of the social skills subscales there was not statistically significant change, there was a trend of improvement. Additionally, subscales such as assertion increased, while hyperactivity and inattention decreased significantly after the art therapy intervention.

According to Epp (2008), social skills training in combination with art therapy showed significant improvements in some social skills. To measure this, the author recruited 66 primary and secondary school students with ASD to participate in a program involving weekly social skills and group art therapy sessions over a school year. The program model used was called SuperKids, which involves groups of about six children led by a therapist. The SuperKids model utilizes cognitive-behavioral strategies, a variety of social skills, and a structured art activity. Outcomes were measured using the Social Skills Rating Scale (SSRS), which was administered to parents and teachers pre and post intervention. Post treatment analysis by Epp found improvements in assertion and decreased scores in internalizing behaviors, hyperactivity, and “problem behavior” scores (p. 34). According to the author, all other social skills indicated improvement, though the results were not statistically significant.

Research has indicated some promising data regarding the use of art with this population. However, results indicate further research must be done to develop statistically significant outcomes. For example, an art intervention designed by Black (2014), called the Stimulus Expression Task (SET) was developed to improve recognition of the emotions of fear and anger in children with ASD. The SET is an art task that involves creating a face with magnetic two-dimensional facial features. The hypothesis was not supported, highlighting the need for further research.

On the other hand, research by Richard et al. (2015) illustrates the notion that art may be a useful tool to help children diagnosed with ASD identify facial expressions. The authors developed a directive called Build a Face (BAF), which was designed for children diagnosed with ASD to improve their ability to recognize faces and emotions. The BAF involves using pre-constructed three-dimensional materials to build a face on a mannequin head in order to indicate different emotions (happy, sad, angry, and fearful). Participants included 19 children (8-14 years) diagnosed with ASD. The participants were divided into two groups; the experimental group was asked to complete the BAF, and the control group received treatment as usual. The Diagnostic Analysis of Nonverbal Accuracy 2-Child Facial Expressions (DANVA 2-CF) was used to measure each child's ability to recognize facial expressions and implied emotions pre and post intervention. The assessment includes 24 cards portraying six of each emotion that the children were to identify and responses were recorded. Results indicated improvement in both groups, though there was not a statistically significant difference between groups. There was, however, a small, but present effect size (analyzed by using Cohen's *d*) in the treatment group that was not present in the control group.

Blankschen (2019) examined the Face Stimulus Assessment (FSA), a series of stimulus drawings to ease participants into drawing a human face, as a means of improving cognitive processing in children diagnosed with ASD. The researcher included 12 children (5-10 years) diagnosed with ASD and 22 neurotypical participants. The three stimuli in the FSA include an outline of a head with facial features, an outline of just a head, and a blank sheet of paper. Participants were asked to complete four face drawings within 30 min: one pre-stimulus drawing (pre-test), two FSA stimulus drawings, and one post-stimulus drawing (post-test). For the pre- and post-test drawings, participants were given a blank piece of paper and told to draw a face.

The two FSA stimulus drawings used the complete face template and the head outline template, respectively. Raters scored the pre- and post-stimulus drawings using the Formal Elements in Art Therapy Scale (FEATS). Analysis revealed a significant difference between pre- and post-stimulus drawings between groups. The ASD group showed increased scores in the Logic scale of the FEATS more so than the non-ASD group. The findings suggest that stimulus drawings can improve logical organizational cognitive processing in children with ASD (p. 19). This may also support the finding that face drawings improve understanding and recognition of facial features in ASD adult populations (Harris, 2015).

Martin (2008) conducted a pilot study also using the FSA to compare the portrait drawings of individuals with ASD to those of neurotypical individuals. The author developed the Portrait Drawing Assessment (PDA) to measure drawing characteristics exhibited in the portraits, such as pressure, size, and line quality, and behaviors observed during drawing, such as eye contact, interest, and indifference. The PDA involves the participant and facilitator drawing each other while being videotaped. The participant's drawing is then scored and video recordings of the session are reviewed (ideally by raters) to score behavior. The pilot study of the PDA included 25 participants diagnosed with ASD (6-20 years). Fifteen neurotypical age-matched participants were also included as a comparison group. Sessions were conducted individually. Participants were allowed 30 min to draw the investigator, who maintained a neutral face, and the investigator simultaneously drew a portrait of the participant. Each child was also given the option to create a free drawing after the initial portrait drawing. The initial portrait drawings were scored by the researcher using the PDA scoring form in which each criterion is given a score of yes or no. After scoring the drawings and video recordings, the author found that individuals with ASD scored higher in the PDA category of interest and lower in indifference than neurotypical individuals. Participants on the spectrum were also more likely to choose to do free drawing afterwards than neurotypical individuals. Martin concluded that portrait drawing effectively fostered connection and engagement of participants with ASD to the researcher. Still, design flaws such as the fact that the researcher measured and scored her own data highlight the need for further research.

While art therapy interventions have demonstrated promising outcomes for children with ASD, little research has been conducted examining art interventions for adults with ASD. A case study by Harris (2015) provides both qualitative and quantitative evidence of the changes in social skills and facial recognition in two participants (aged 23 and 44). The researcher used several tests to measure changes in sociability, including the FSA, the FEATS, and a questionnaire based on the Social Skills Rating System (SSRS). Harris did not specify what directions were provided for the FSA, but it is implied that participants were asked to complete the drawings with the last one being a free drawing. The FEATS was utilized to score the FSA. The SSRS is an assessment of social skills, including social ability, communication, and eye contact rated by an observer. Harris utilized four questions from the SSRS and added one more related to eye contact as part of her questionnaire.

Harris' (2015) study was conducted over six weeks with weekly sessions varying in duration. After each session, the questionnaire was administered to the staff who worked with each of the two participants. During the first week, participants were given the FSA, which was deconstructed and scored by Harris using the FEATS. During the next four weeks, participants completed self-portraits, a portrait of the researcher, and two sessions of drawing neurotypical peers. Each of these sessions paralleled the FSA in that they used three directives to ease the participants into the task. In the final week, participants were again given the FSA and the FEATS was again used to score the results.

Harris (2015) concluded quantitative and qualitative results supported the use of portrait drawing to improve social skills, eye contact, and engagement and recognition of the human face. An interview conducted by Harris with the one participant who completed the study revealed that she felt more comfortable observing faces and felt more competent identifying emotions and facial expressions. The researcher also observed that both participants showed increased eye contact. Additionally, the researcher observed that one participant showed higher confidence, energy, and investment in drawing post-test. The participants missed several weeks of their day program, so the results were not measured consistently. Still, the SSRS indicated that one of the participants improved slightly in her ability to listen to others. Quantitative results also revealed that one participant improved on almost every measure of the FEATS from her pretest to post-test drawings of the FSA. Despite some of the weaknesses of Harris' study including FEATS scoring and interviewing being done by the researcher, particularly in the more objective SSRS scores, the results indicated promising possibilities for the use of therapeutic portraiture in adult ASD populations and suggested that further research be done using larger samples.

Research into effective art therapy interventions for individuals on the autism spectrum is limited, particularly for high functioning adults. Of the research that does exist, many have had methodological flaws that resulted in non-significant results (Black, 2014; Harris, 2015; Richard et al. 2015). Harris' (2015) study on portrait drawing with ASD inspired the design for the present study. The present study involved a randomized controlled experimental design using a modification of Harris' design, to measure the effectiveness of portrait drawing as an art intervention to improve social skills in individuals diagnosed with ASD. As pointed out by

Harris, observing and drawing a face should enable the participants to develop a better understanding of facial structure and expression and therefore increase comfort with socializing and decrease social anxiety.

For this present study, three hypotheses were tested. First, it was hypothesized that the portrait drawing group would improve social skills generally as measured by the Autism Social Skills Profile to a greater degree than a control group drawing a still life. A second hypothesis was that the portrait drawing task would improve facial recognition and eye contact related items on the ASSP (items 14, 15, 18, and 43) more so than the other condition. The third hypothesis was that social anxiety as measured by the Social Interaction Anxiety Scale would be lowered in the portrait drawing group more so than the still life group. It should be noted that after beginning data collection, the COVID-19 pandemic forced the shutdown of the study due to risk of infection at the facilities, and therefore only a subset of the intended sample was run.

Method

Participants

Adults diagnosed with autism spectrum disorder (ASD) with a severity level of 1 or identified as high-functioning by staff who work with them were recruited from non-profit agencies in Connecticut that serve individuals with disabilities including ASD. Diagnostic information was confirmed with the facilities from which the participants were recruited. Originally, the present researcher intended to collect data from 30 participants. Due to concerns involving the rapid development of COVID-19 at the time of this study, it was decided by the researcher and all involved that the collection of data be ended prematurely to uphold social distancing practices and mitigate the spread of the virus. Therefore, data could only be obtained from 10 individuals. Additionally, the post-tests could not be administered to three of the participants, so the final data reflects the results of only seven participants. The sample that was included in final analysis included adults aged 22 to 38 (*M*=28.9, *SD*=6.4). In terms of gender identity, 5 participants identified as men and 2 identified as women. The racial and ethnic distribution included 5 participants who identified as non-Hispanic white, 1 who identified as black or African American, and 1 who identified as Asian or Pacific Islander.

Instruments

Autism Social Skills Profile

A modified version of the Autism Social Skills Profile (ASSP; Bellini & Hopf, 2007) was filled out by members of the staff who work closely with each of the participants. The original ASSP was designed for children, but the questions are appropriate regarding adults as well. The instructions of the ASSP were modified for the current study to change phrases such as "your child" to "your client" to make the test more appropriate for staff to fill out. The ASSP is a fixed-choice observer-report survey designed to measure several areas of social functioning over the last three months. For this study, the time frame was changed to "over the last week."

The measure includes three distinct social skill subscales: social reciprocity, social participation/avoidance, and detrimental social behaviors. These scales are examined separately and added together to indicate a total level of social functioning. There are 49 questions scored on a Likert type scale from 1 (never) to 4 (very often); total scores can range from 49 to 196. Each question also includes a space to include a "brief description." High scores indicate positive social behaviors.

Bellini and Hopf (2007) tested the reliability and validity of the ASSP using a sample of 340 children ages 6 to 17 diagnosed with ASD. The sample included 232 high-functioning children and the rest were identified as nonverbal or intellectually disabled. The authors found that the ASSP displayed excellent reliability and some preliminary evidence of validity. Internal consistency was found with a Cronbach's alpha of 0.94 for the high-functioning group and 0.93 for the total sample. Tests-retest reliability had a correlation coefficient of 0.90 over one week. Criterion concurrent validity was tested by asking caregivers whether the child had at least one friend or no friends. It was found that children who had at least one friend scored significantly higher on the ASSP, providing some evidence for criterion validity.

Social Interaction Anxiety Scale

To measure the experience of social anxiety, participants were asked to complete the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) pre- and post-treatment. The SIAS is a self-report survey, consisting of 20 questions rated on a Likert-type scale from 0 (not at all) to 4 (extremely) of how much one experiences fear in social interactions.

Assessments of the psychometric properties of the SIAS by Mattick and Clarke (1998) and Heimberg et al. (1992), have shown that the SIAS demonstrates good validity and excellent reliability. Mattick and Clarke (1998) reported Cronbach's alphas of 0.88-0.93 across several populations. Additionally, the test-retest correlation coefficient was above 0.90 over 1 and 3 months. Concurrent validity was also tested and the SIAS was found to positively correlate with scales measuring fear of negative evaluations, social avoidance and distress, social phobia, and audience anxiety. Heimberg et al. (1992) used a sample of 66 individuals diagnosed with social phobia, and 103 non-phobic individuals including 50 community volunteers and 53 college students. The researchers found significant results in the classification of social phobia with the SIAS, which correctly identified 82% of the individuals with social phobia and incorrectly identified only 18% of the community volunteers. They also found good internal consistency between 0.85 and 0.90.

Materials

During each session, participants were provided with 9 in. x 12 in. (23 cm x 30.5 cm) Pacon Bright White 50lb drawing paper, No. 2 pencils, erasers, and pencil sharpeners. For the first session, 5 in. (12.7 cm) round stand up mirrors were provided to each participant in the portrait group. An arrangement of plastic fruit was planned to be used for both sessions of the still life group; however only one session of the still life condition was able to be conducted.

Procedure

The study was conducted in small group settings in the facilities participants were recruited from to promote comfort in the setting. Informed consent (Appendix A) was distributed prior to the first session to legal guardians of participants without power of attorney. The ASSP forms were distributed to staff blind to the experiment who worked closely with the participants. Scored ASSP forms were then collected prior to the first task. Conditions were randomly assigned to the settings where data was gathered due to small group sizes in each agency. The two conditions included a portraiture group (PG) who completed one self-portrait and one peer portrait and a still life group (SL), who drew a still life of fruit over two sessions. Both groups continued to receive their regular treatment provided by their respective day programs. Due to complications from COVID-19, only one session of the still life condition could be completed.

In the first session of the PG, participants were given an assent form (Appendix C; individuals with power of attorney were given informed consent) a demographic survey (Appendix D), an art release form to obtain permission to reprint artwork, and the SIAS. Materials were numbered and placed in folders to de-identify artwork and maintain confidentiality. In the first session, participants were asked to use the mirror provided to draw a self-portrait. They were given 15 min to complete the self-portrait and participants were encouraged to utilize the entire time provided and add as much detail as possible. The purpose of the directive in the first session was to provide the participants a non-threatening introduction to portraiture. In the SL condition, participants were asked to create a drawing of a still life arrangement of fruit in a bowl that this researcher arranged. Participants were given 15 min to match the PG.

The second session of the PG condition was held one week after the first. In this session, participants were paired randomly and seated across a table from a partner. They were asked to take turns "posing" and drawing a portrait of their partner. No instructions were given regarding facial expression or talking to allow natural interactions between participants. Each partner was given 15 min to complete their portrait. The second session of the SL group was intended to be limited to 15 min and the arrangement of fruit was to be slightly altered, however a second session was not conducted for the SL group due to the pandemic shutdown.

After all drawings in the second session of the PG condition were completed and collected, the SIAS was re-administered. As follow-up, one week after the second session the ASSP was re-administered to the same staff for the PG and debriefing forms were sent to all participants (Appendix E) after staff filled out post-test measures. The SL group did not receive the post-test measures.

Results

Scores on the ASSP and SIAS were summed separately after appropriate items were reverse scored (items 37-43 on the ASSP and items 5, 9, and 11 on the SIAS) to reveal a total social skill score and a total social anxiety score. Scores on the pre-test of the ASSP ranged from 93 to 160 (*M*=122.80, *SD*=23.35) and from 96 to 156 for the post-test (*M*=127.29, *SD*=18.87). Pre-test scores for the SIAS ranged from 8 to 40 (*M*=25.10, *SD*=12.72) and from 12 to 51 on the post-test (*M*=29.86, *SD*=14.44). Additionally, items 14, 15, 18, and 43 were summed on the ASSP for a total facial recognition (FR) score with possible scores ranging from 4 to 16; higher scores in this area indicate better facial recognition ability. Pre-test scores for FR ranged from 6 to 14 (*M*=8.90, *SD*=2.60) and post-test scores ranged from 9 to 15 (*M*=10.71, *SD*=2.63).

A t-test for paired samples was conducted to determine if there was a significant change from pre to post-test on the ASSP, SIAS, and FR in the 7 participants in the portrait drawing group. There was a small increase of 7.57 (*SD*=11.41) in ASSP scores, however the change was not significant, *t*(6)=1.76, *p*=.065 (one-tailed). There was no difference in SIAS scores pre to post-test (see Table 1). There was, however, a statistically significant increase in facial recognition scores (*M*=1.71, *SD*=1.11), *t*(6)=4.08, *p*=.004 (one tailed).

To determine the observed effect of each intervention, the effect size was calculated using Cohen's *d* for the ASSP and FR scores using an online calculator (Effect Size Calculator). The effect size for the ASSP was .66, indicating a moderate effect, and the FR effect size was 1.53, which indicates a large effect. A power analysis was also conducted for the two tests to determine the statistical power of each result. According to the Post-hoc Statistical Power Calculator (2020), the power of the ASSP was 0.56 and the FR was 0.59, which indicate low power.

Discussion

The hypotheses of the present study are only partially supported with the data collected because the control group could not be completed; however, the results are promising for the FR and ASSP scores. Facial recognition was significantly improved after the portrait drawing condition. Social skills also showed a small improvement with a moderate effect, though it was not statistically significant. While the social anxiety scores did not improve, they also did not go up, indicating that this directive did not seem to induce social anxiety even if scores were not reduced as intended.

These results are mostly consistent with previous literature. Similar to studies by Harris (2015), D'Amico and Lalonde, (2017), Epp (2008), and Richard et al. (2015), scores for social skills did show improvement even if it was not statistically significant. However, unlike these studies, the present study was able to demonstrate a significant improvement in the area of facial recognition, a feature of ASD that can specifically affect identification of emotion and social inhibition (Avery et al., 2016; Baron-Cohen et al., 1999).

Interestingly, Martin's (2008) research indicated participants with ASD tended to be more interested and less indifferent to the facial drawing task and also requested more time to free draw after completing the given task. However, participants from the current study completed drawings quickly and appeared eager to leave once the given tasks were completed. This was especially true for the PG; however, the SL group also completed artwork relatively quickly. This could have been due to the fact that a large number of participants were tested in their day programs where other preferred activities were available. One participant was observed asking to use his iPad after completing his drawing. Additional time was not explicitly offered, but extra paper was visible to all participants. Martin did offer additional time to create art after the study was completed, which could account for this difference. Martin's study was also conducted in an after-school setting. Therefore, the difference in settings may also have contributed to the difference in observed interest.

Two themes were observed in the artwork created during the first and second session of portrait drawing: 1) inclusion of a body and 2) increased expressiveness in drawn faces. The two highest scores for change from pre-test to post-test facial recognition (FR) illustrate this. In one set of drawings done by a 22-year-old male with an increase in FR (see Figure 1), the second drawing includes an entire body, while the first includes only a face. This could indicate an increased awareness of the connection between the head/face and the entire person, consistent with the increased FR score. The second image also includes eyes that are filled in as opposed to the first drawing in which the eyes appear emptier. This seems to imply greater expressiveness in the second face.

Another drawing by a 35-year-old male (see Figure 2) whose FR score also increased shows an increase in facial expressiveness and from the first to the second drawing as well as an inclusion of a body in both drawings. While the first image appears to be a stereotypic image of a smiling face, the second appears to show some more unique emotion, as evidenced especially through the area around the mouth. Additionally, both of the images from this participant included the full body. It is also possible that because Autism Spectrum Disorders affect sensory perception (APA, 2013) which is experienced primarily throughout the whole body, the artwork of those with ASD may unconsciously focus on the body in artwork.

Finally, one drawing completed by a participant who did not show any increase in FR scores, appears to display graphic themes that are the opposite to those cited above (see Figure 3). The facial features in the first and second image are nearly indistinguishable and both depict a stereotypic smiling face. Further, whereas the first image (the self-portrait) includes the full body, the participant does not include the bottom half of the body in the second drawing despite having enough time to continue drawing. This may lend further evidence to the observation that improvements in facial recognition also seem to indicate increased awareness of the full person.

The trend of improvement of social skills and the significant improvement of facial recognition support the use of portrait drawing in clinical art therapy settings. While it cannot be confidently theorized that portrait drawing would be more successful than other forms of artmaking in improving facial recognition, the results do point to a positive trend that should not be ignored. Additionally, portrait drawing undoubtedly forces individuals to look at a human face and potentially make eye contact, which can serve as a starting point for further social skills training or psychoeducation.

It may also be concluded from the results that certain trends in portraits done by adults with ASD may indicate progress in facial recognition. As mentioned above, inclusion of a body and increased facial expressiveness seemed to coincide with increased FR scores. However, further research into potential markers in artwork should be done to determine if these findings can be used more reliably in clinical practice.

Limitations of the present study included the lack of control group, small sample size, and condition of the setting. The results cannot support this intervention as more effective than any other activity due to the lack of a control group. It is unknown if improvements seen in FR and ASSP scores were due to the portrait drawing intervention or another factor such as simply doing art in a group setting. Most participants also continued to receive social skills training during the study, so improvements may be attributed to this; however, some participants' social skills sessions did not occur over the two weeks the study was conducted due to the schedule of the agency. Therefore, it is reasonable to conclude that results were not solely a product of social skills training. Additionally, sessions were conducted in the facilities at which participants were regularly meeting for convenience and comfort. As such, environmental factors and noise level varied across sessions.

Lack of specific inclusion criteria may have also had an effect on results. All participants were identified as high-functioning by program staff, however some participants with cooccurring intellectual disabilities were included in the sample. It was observed that some participants may have rushed through the SIAS or questions were not fully understood. For example, several of the forms appeared to have answers circled in deliberate patterns. This may have contributed to inconclusive data for the SIAS. Future research with this population may benefit from more defined inclusion criteria to create a more functionally homogenous group of participants. Additionally, questionnaires should be assessed for readability and length to accommodate for different levels of functioning.

It was also observed that participants finished the drawing directives relatively quickly and many of the drawings were stereotypical or schematic depictions of faces with few unique features regardless of the subject of the drawing. No participants utilized the entire 15 min limit and almost all finished within 5 min. Inclusion of a teaching component to encourage participants to observe and depict various facial features may have improved the directive by drawing attention to facial features that are not commonly observed further strengthening social skills and facial recognition. Furthermore, the simplicity of materials provided could have contributed to less time spent on the directive. While pencil was useful to promote control and comfort because of its ubiquity and ease of use, participants with limited artistic experience may have had difficulty including detail due to the precision and monochromatic nature of graphite. Including colored pencils or markers to allow participants to add color and additional details may alleviate this issue in the future.

A small qualitative study by Raffaelli and Hartzell (2016) compared responses to drawing using various colored and monochromatic materials and collage. They concluded that collage may be more effective to introduce people to art making while pencil can challenge them to move out of their comfort zone. Participants also stated they felt the inclusion of color was beneficial because it allowed them to more accurately depict what they wanted. Future studies may benefit from the inclusion of colored drawing materials in later sessions, but perhaps using collage or #2 pencil in the first session to allow participants more control and to build comfort with artmaking.

In addition to the aforementioned suggestions, follow-up research may benefit from including more sessions of portrait drawing with ASSP and SIAS measurements taken more frequently to more accurately observe change over time. For example, conducting the study over six weeks similar to Harris' (2015) design and completing the ASSP before the first week, after the third week, and after the last week could produce more robust data. The directive may also reveal more significant results with time to process the artwork after each drawing directive. This would ensure more time is spent encountering the human face through art and that the participants are fully experiencing the potential benefits of the directive.

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Table 1

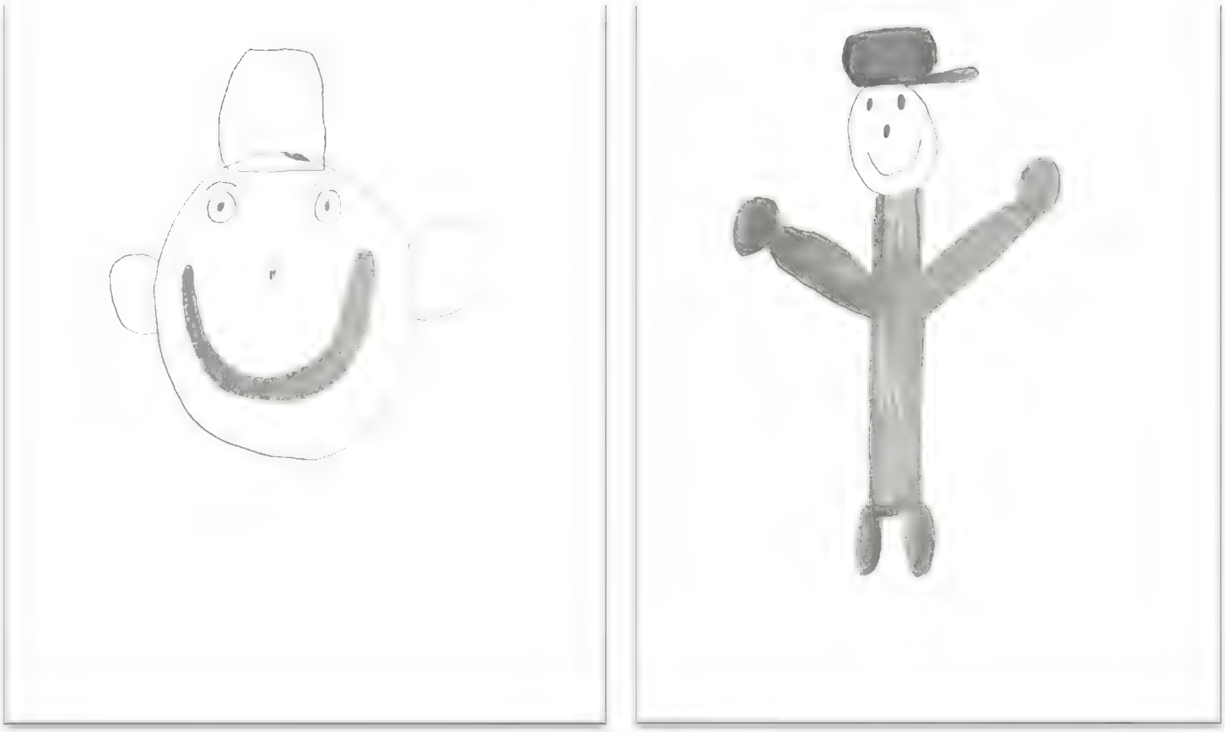
Portrait Drawing Group Scores (n=7)

	Difference Score		Pre-test		Post-test				
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*t*	*df*	*p*
ASSP	7.57	11.41	119.71	20.49	127.29	18.87	1.76	6	.065
SIAS	0.00	9.29	29.86	11.57	29.86	14.44	.00	6	1.00
FR	1.71	1.11	9.00	2.83	10.71	2.63	4.08	6	.004*

Note. All paired sample t-test scores are one-tailed.

Figure 1

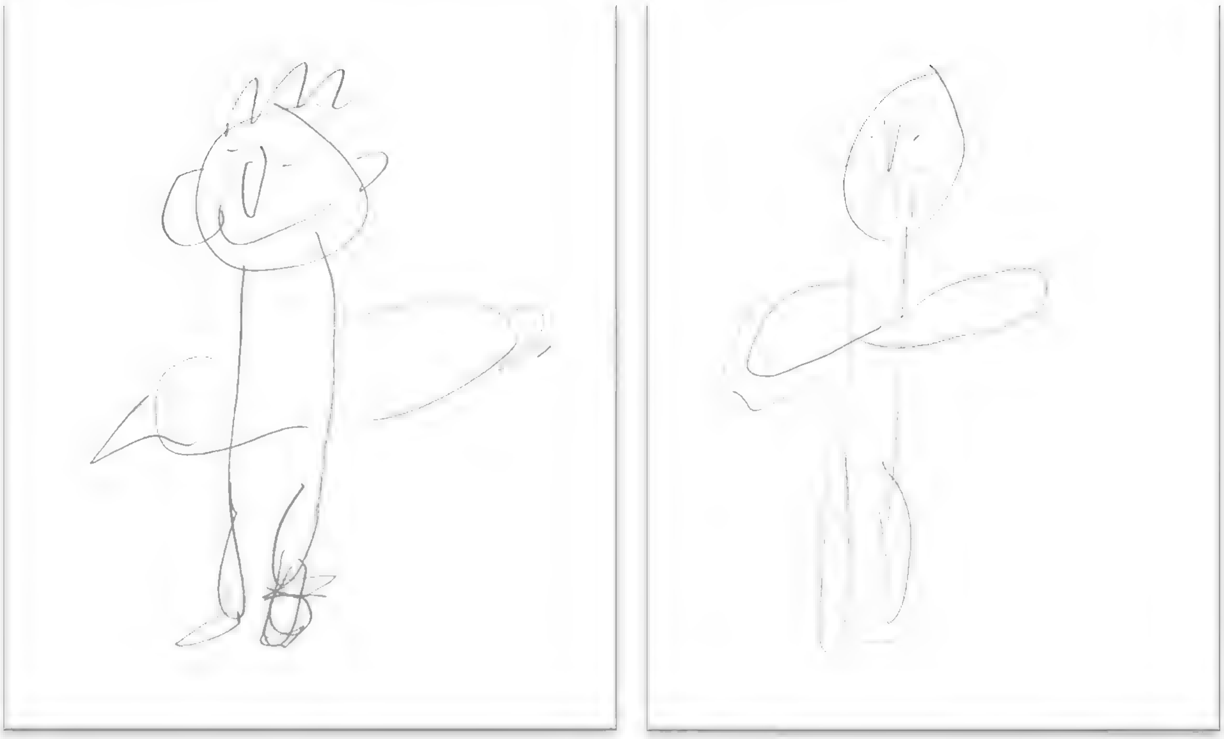
Portrait Drawings by 22-year-old Caucasian Male with Increased FR



Note. Inclusion of a body, a feature of drawings with higher scores of FR, is seen in these drawings done by a 22-year-old Caucasian male. This participant's FR score increased by 3 points.

Figure 2

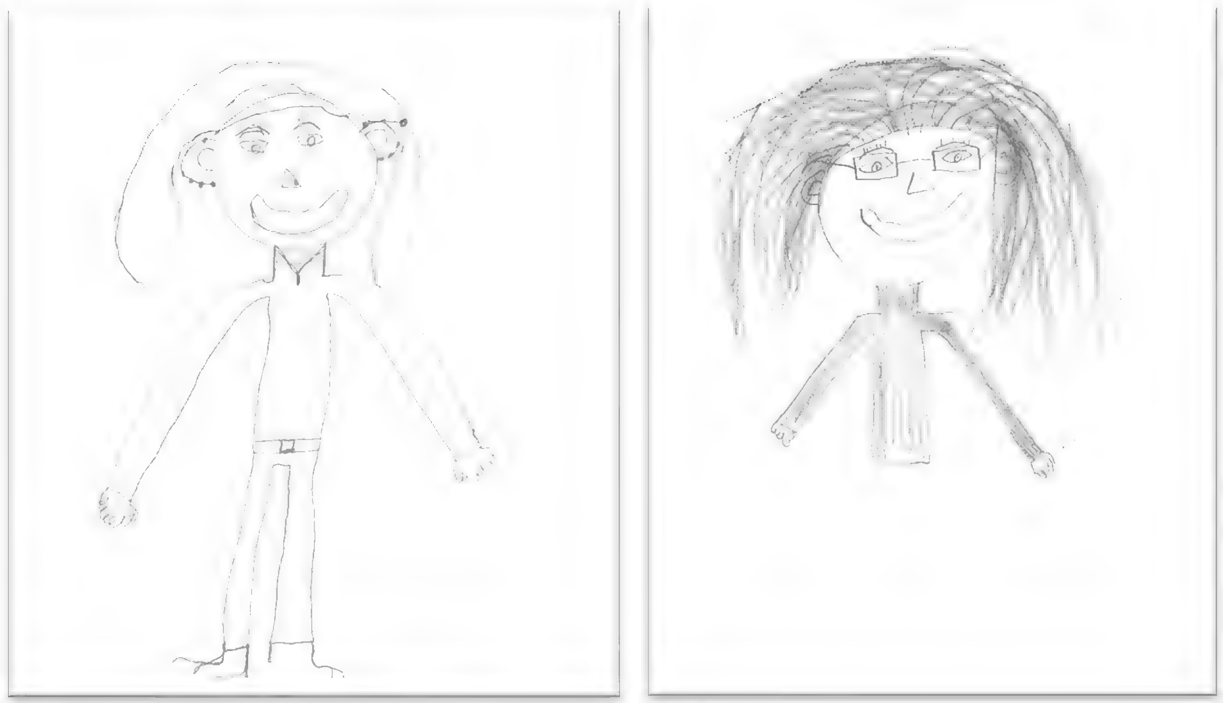
Portrait Drawings by 35-year-old Caucasian Male with Increased FR



Note. Increased expressiveness, another feature of drawings with higher scores of FR, is seen in the second drawing done by a 35-year-old Caucasian male. This participant's FR score increased by 3 points.

Figure 3

Portrait Drawings by 23-year-old Caucasian Female with Unchanged FR



Note. Lack of unique expression can be seen in these drawings done by a 23-year-old Caucasian female. Minus features such as the hair and glasses, there are no other characteristics distinguishing the first portrait from the second. Some of the body that was originally included was also lost in the second picture. This participant's FR score showed no change post-test.

Appendix A

Informed Consent Form

This study is being conducted as part of the requirements for the Masters of Arts in Art therapy and Counseling degree at Albertus Magnus College. The goal of this study is to explore the effects of portrait drawing. During this study, you will be asked to participate in art making and fill out a questionnaire on how you feel. Please note that your art-making abilities are not a factor in this study. You will also be evaluated by staff with whom you work regularly to help the researchers get to know more about you. All information collected will be confidential and the study is expected to take approximately 40-70 minutes once a week over two weeks. To maintain confidentiality, the artwork created during this study will be numbered and your name will not be connected to the work in any way. You will be told at the end of the study the purpose of the information collected.

Potential risks involved with participation in this study may include frustration with art making and possible negative feelings from the questionnaire mentioned above. Participation in this study is completely voluntary, and you are able to withdraw at any point in time without penalty. The benefits of participating include assisting a graduate student in the completion of her thesis requirement, as well as contributing to research on the effects of art therapy. You may also enjoy the art activities. This study has been approved by the Albertus Magnus College Institutional Review Board (IRB).

If you have any known allergies to art materials, please inform the researcher. If you have any questions or concerns about this research, you may contact the following individuals:

Investigator	Art Therapy Advisor	Psychology Advisor
Emili Dubar	Abbe Miller, Ph.D., ATR-BC, LPC	Hilda Speicher, Ph.D.
emdubar@albertus.edu	amiller@albertus.edu	hspeicher@albertus.edu

Or:
Chair of IRB
Sean O’Connell, Ph.D.
soconnell@albertus.edu

By signing this form, I acknowledge that I am 18 years of age or older, understand the study described above, and agree to participate in the aforementioned study.

Print name Date

Signature

____ I have received a copy of this form to keep for myself.

Appendix B

Art Release Form

Art Image Release Form: Drawing and ASD

The artwork that you create during this study will remain confidential. Your name will not be connected with your artwork. Photographs of the artwork will *only* be taken with your consent for the purposes listed below. Photographs taken of the artwork *will not* contain any identifying information.

I agree to have my artwork photographed without identifying information for the following purpose(s): (Please check all that apply)

- ☐ Educational and training purposes
- ☐ Presentation at a professional conference
- ☐ Publication in a professional journal
- ☐ None of the above

I hereby give consent as noted above for the use of my artwork

____

Print name Date

____

Signature

Please note that if at a later date you choose to withdraw permission for your artwork to be shown as noted above, it may be difficult or impossible to contain images already disseminated in public settings.

____________________ I have received a copy of this form to keep for myself.

Appendix C

Assent Form

This study is being conducted as part of the requirements for the Masters of Arts in Art therapy and Counseling degree at Albertus Magnus College. The goal of this study is to explore the effects of portrait drawing. During this study, you will be asked to participate in art making and fill out a questionnaire on how you feel. Please note that your art-making abilities are not a factor in this study. You will also be evaluated by staff with whom you work regularly to help the researchers get to know more about you. All information collected will be confidential and the study is expected to take approximately 40-70 minutes once a week over two weeks. To maintain confidentiality, the artwork created during this study will be numbered and your name will not be connected to the work in any way. You will be told at the end of the study the purpose of the information collected.

Potential risks involved with participation in this study may include frustration with art making and possible negative feelings from the questionnaire mentioned above. Participation in this study is completely voluntary, and you are able to withdraw at any point in time without penalty. The benefits of participating include assisting a graduate student in the completion of her thesis requirement, as well as contributing to research on the effects of art therapy. You may also enjoy the art activities. This study has been approved by the Albertus Magnus College Institutional Review Board (IRB).

If you have any known allergies to art materials, please inform the researcher. If you have any questions or concerns about this research, you may contact the following individuals:

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Emili Dubar	Abbe Miller, Ph.D., ATR-BC, LPC	Hilda Speicher, Ph.D.
emdubar@albertus.edu	amiller@albertus.edu	hspeicher@albertus.edu

Or:
Chair of IRB
Sean O'Connell, Ph.D.
soconnell@albertus.edu

By signing this form, I acknowledge that I am 18 years of age or older, understand the study described above, and agree to participate in the aforementioned study.

____
Print name Date

____
Signature

____ I have received a copy of this form to keep for myself.

Appendix D

Demographic Form

1. What is your age? ________

2. Which option best represents your primary ethnic identity?

________ Black or African American

________ White (non-Hispanic)

________ Hispanic/Latinx

________ Native American or American Indian

________ Asian/Pacific Islander

________ Other

3. Which option best represents your gender identity?

________ Man

________ Woman

________ Not Listed ________________________________

________ Prefer not to state

Appendix E

Debriefing Form

Debriefing Form: Portraiture and ASD

The purpose of this study was to test the use of portraiture as an art therapy intervention for adults on the autism spectrum. Research has suggested that portraiture in art therapy may be useful in improving certain social skills, which may also be linked to social anxiety. The questionnaire you were given measures social anxiety. Staff with whom you work regularly were given questionnaires to measure social skills. Participants were randomly divided into two groups. One group drew portraits and the other group drew still life drawings of fruit.

The hypothesis was that those participating in the portraiture condition would improve in social skills and have less social anxiety, more so than those doing still life drawing.

If you would like to know the results of this study, please provide your email address to the researchers. Please note that results can only be provided in aggregate.

Thank you for your voluntary participation in this study!